

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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In re Application of

Examiner: A. Rodriguez

Hideyuki Serizawa

Group Art Unit: 2733

Parent Appl. Serial No. 09/176,579

Continuation Appl. Serial No.

Parent Appl. Filed: October 21, 1998

Continuation Appl. Filed: Herewith

For: CONTROL METHOD AND APPARATUS  
FOR STABILIZING OPTICAL WAVELENGTH

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**PRELIMINARY AMENDMENT**

Hon. Commissioner of Patents  
and Trademarks  
Washington, D.C.20231

SIR:

Prior to the examination of the above-referenced continuation patent application, please enter the following amendments.

**In the Specification:**

On page 1, line 1, please add the following:

**-Cross-Reference to Related Applications**

The present application is based on, and claims the benefit of priority from, Applicant's co-pending U.S. Patent Application Serial No. 09/176,579, filed on October 21, 1997, which in

turn claims the benefit of priority from Japanese Patent Appl. No. 9-292228 filed on October 24, 1997, both of which are incorporated by reference herein as fully as if set forth in their entirety.--

**In the Claims:**

Please cancel all pending claims and add the following new claims:

--1. An optical signal transmitter comprising:

a laser diode for outputting an optical signal to be transmitted;

a driving current source for driving said laser diode;

a plurality of control circuits to output control signals for controlling the optical wavelength of said laser diode in different control modes; and

a selector arranged so as to select one of said control modes according to the external conditions of said laser diode, and to apply a control signal output from said selected control circuit to said laser diode, thereby achieving stabilizing control of optical wavelength in said selected control mode.

2. An optical signal transmitter comprising:

a laser diode for outputting an optical signal to be transmitted;

a driving current source for driving said laser diode;

a parameter deviation detector to detect a first control deviation of one parameter responsible for causing variations of optical wavelength output from said laser diode from a predetermined target value;

an optical wavelength deviation detector to detect a second control deviation of optical

wavelength output from said laser diode from a predetermined target value;  
a selector connected to said detectors so as to select either of said first and second control deviations; and  
a manipulator arranged to manipulate one of said parameters so that said selected control deviation is reduced.

3. An optical signal transmitter according to claim 2, wherein one of said parameters is laser temperature.

4. An optical signal transmitter according to claim 2, wherein one of said parameters is driving current for driving said laser diode.

5. An optical signal transmitter according to claim 2, wherein said selector is constructed so as to select said first control deviation when said second control deviation is stably detected by said optical wavelength deviation detector, and to select said second control deviation when said second control deviation is not stably detected.

6. An optical signal transmitter comprising:  
a laser module including a laser element, a temperature sensor and a cooling/heating element;  
a first controller for stabilizing said optical wavelength;  
a second controller for stabilizing said optical wavelength; and  
a selector arranged so as to select either of output signals from said first and second

controllers according to the external conditions, so that stabilizing control of the optical wavelength of said laser element is performed according to the output signal from the selected controller, wherein:

    said first controller comprises a temperature monitor coupled with said temperature sensor to monitor the temperature of said laser element detected by the temperature sensor, a first comparator coupled with said temperature monitor to detect the difference between the output value of the temperature monitor and a laser temperature control target value, and a first current controller coupled with said cooling/heating element to control the current flowing in the cooling/heating element according to an output signal from said first comparator, and

    said second controller comprises an optical coupler arranged to split the output light from the laser module, an optical wavelength monitor coupled with said optical coupler to monitor the wavelength of the split output light, a second comparator coupled with said optical wavelength monitor to detect the difference between the monitored optical output wavelength value and a wavelength control target value, and a second current controller coupled with said cooling/heating element to control the current flowing in the cooling/heating element according to an output signal from said second comparator.

7. An optical signal transmitter according to claim 6, wherein said first and second current controller comprise a common current controller connected to said first and second comparators through said selector.

8. An optical signal transmitter according to claim 6, further comprising:  
    a delay circuit coupled with said selector so as to delay the current control of said

cooling/heating element based on said selected controller by a predetermined time after either of said first and second controllers to be selected is determined.--

**Fees**

Any additional fees or charges required at this time in connection with this application may be charged to Patent and Trademarks Office Deposit Account No. 12-2825.

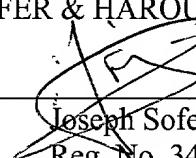
**Conclusion**

In view of the aforementioned amendment and remarks, it is respectfully submitted that all claims currently pending in the above identified application are now in condition for allowance, the earliest possible notice of which is earnestly solicited. If in the Examiner's opinion the prosecution of the present application would be advanced by a telephone interview, he is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,

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